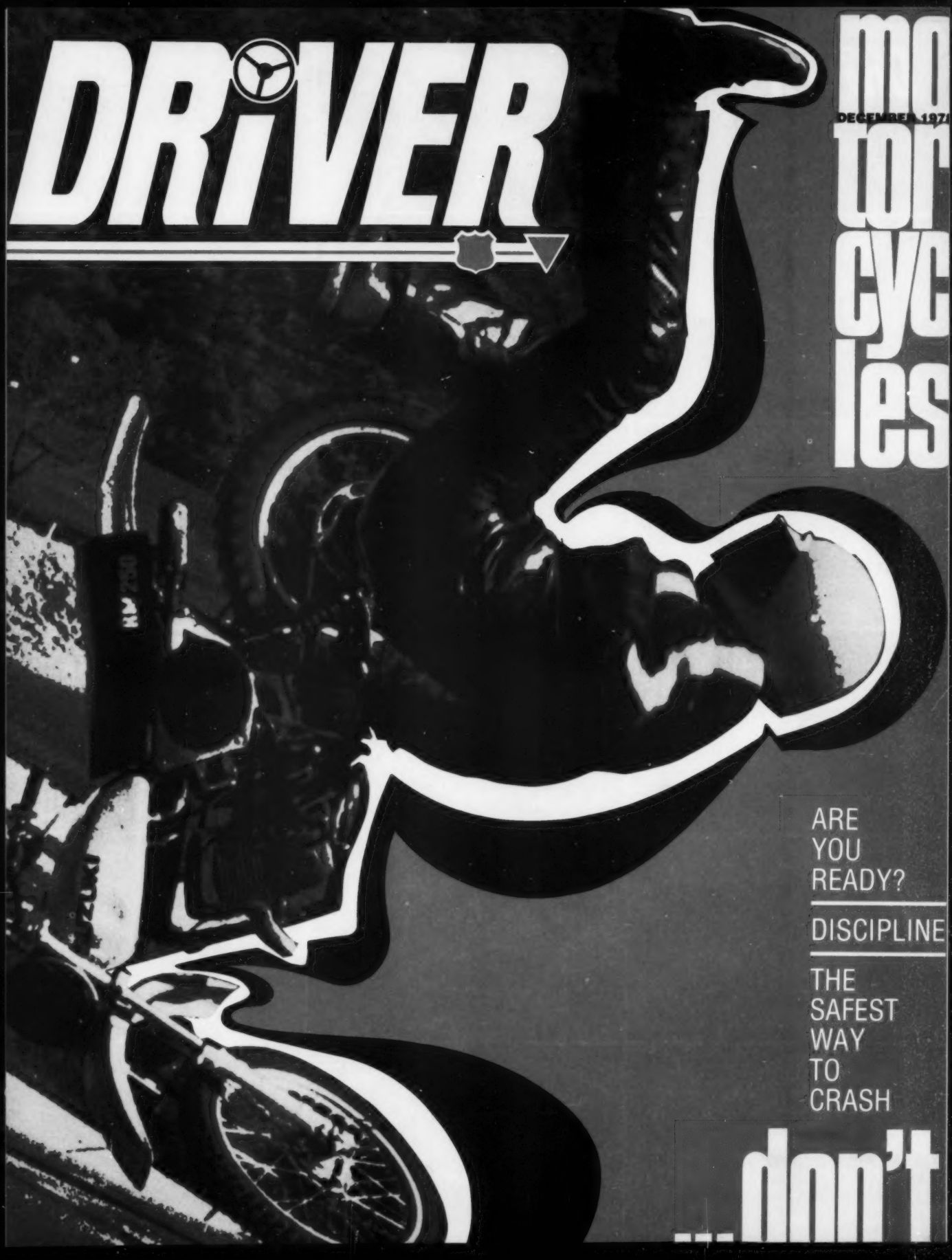
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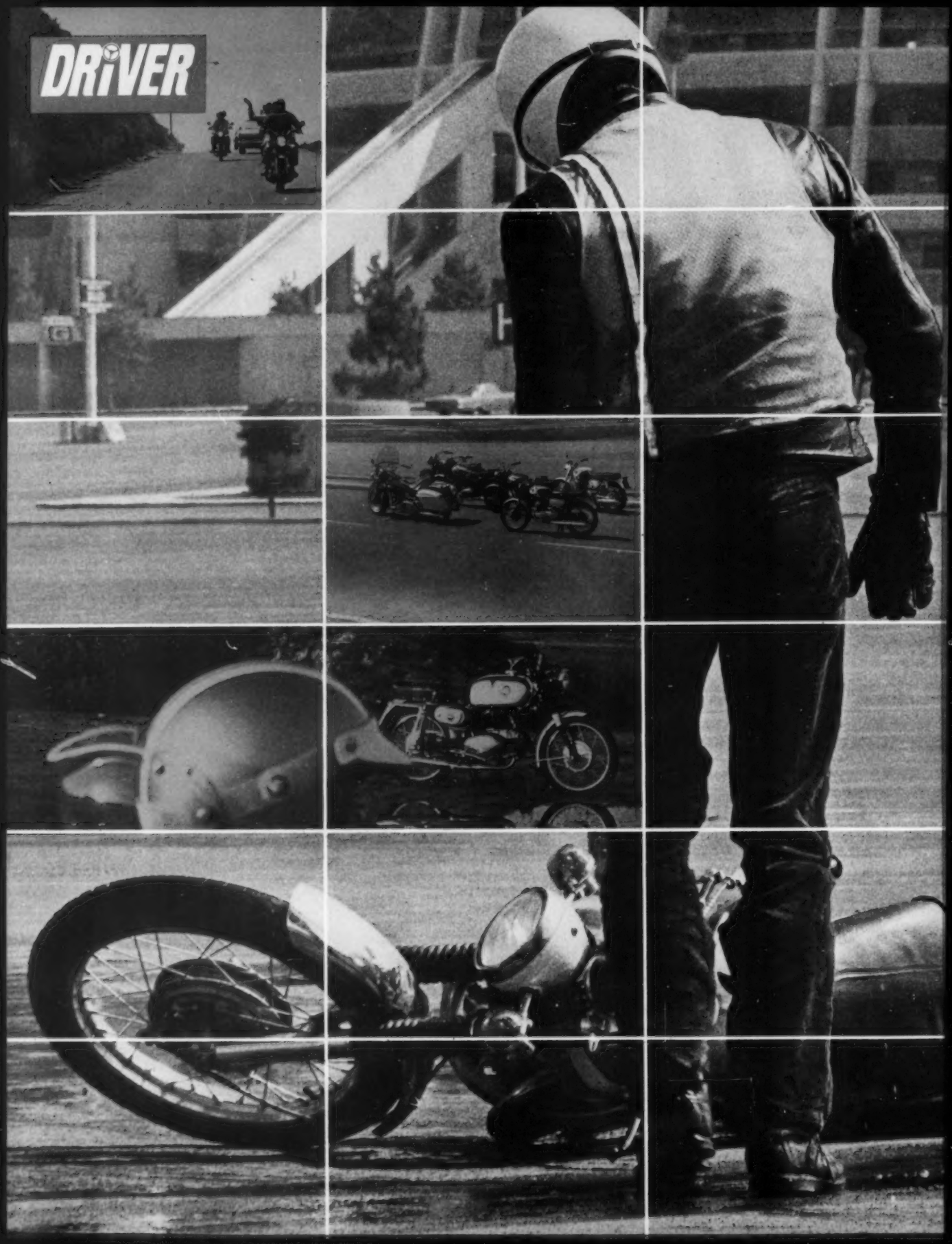
DECEMBER 197
motorcycles
ARE YOU READY?
DISCIPLINE
THE SAFEST WAY TO CRASH
...don't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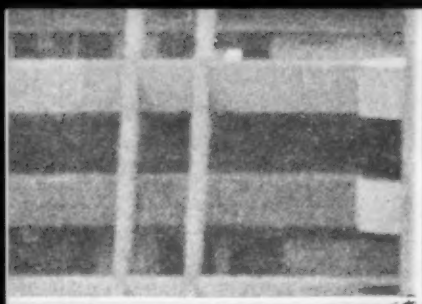

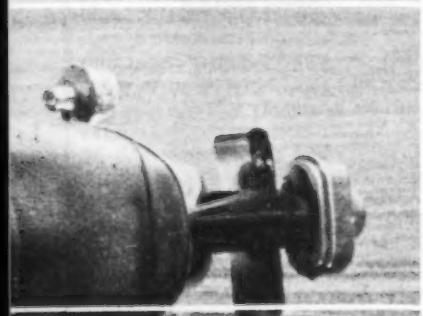

by SSgt DON R. HOLT

are you Ready?

Our Technical Editor talks with Prof. Harry Hurt, who says: "If you ride a motorcycle and you (a) have tattoos, (b) don't wear a helmet, (c) don't wear eye protection, (d) take a lot of short trips, (e) ride in traffic, and (f) don't have a fairing on your bike, then you'd better read this article . . . YOU'RE GONNA NEED IT!"

Dr. Hugh H. Hurt, Jr. (known affectionately as "H3" to some of us, "Harry" to most of us) is a Professor of Safety and the principal investigator of a motorcycle accident investigation program that is turning up some mighty interesting bits of info. Now, Harry isn't your typical professor, unless you consider it typical that when we talked to him we almost had to pull him off his Bultaco trials bike to get this interview. He's quite outspoken on the subject of motorcycle safety and doesn't pull many punches.

And if you fit the profile listed above, or if you plan to purchase a bike sometime, or even if you currently ride accident-free, it would be a good idea if you take a few minutes and read along . . . we think you'll find he has some interesting things to say.

The program: Professor Hurt and his staff at the University of Southern California are working on a program of Motorcycle Accident Cause Factors and Development of Countermeasures. Funded by the National Highway Traffic Safety Administration (NHTSA) under the Department of Transportation (DOT), the factors and countermeasures discovered by this group will eventually be incorporated into the National Accident Data Plan called NASS (National Accident Sampling System).

The 10 currently-operating NASS teams will then use Harry's info (along

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VOLUME 12 NUMBER 7

CONTENTS

Features	Page
Are You Ready?	1
D-I-S-C-I-P-L-I-N-E Key Word to Motorcycle Safety	10
The Safest Way to Crash . . . DON'T!	14
Can You See?	Back Cover

Departments	
Double Clutch	2
Timely Topics	12
The Backyard Mechanic	22
Backfire	28

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THE EDITOR SPEAKS
DOUBLE CLUTCH

THINKING CHRISTMAS?

This isn't the season when DRIVER talks about mopeds—since they're really a fair weather vehicle—but in case you're thinking of buying one as a special Christmas present we'd like to suggest a little research. Stop by the library and take a look at the June 1978 issue of *Consumer Reports*, a Consumers Union (CU) magazine. You'll find an in-depth study, comparing different brands of mopeds for quality, general reliability and SAFETY. CU says that, on the whole, mopeds are quite reliable and economical. The low-speed capability of the moped clearly diminishes the risk of severity of accidents. But low speed can be a hazard if drivers are unable to keep up with city traffic, a factor that dictates that mopeds be driven defensively at all times.

The major drawbacks CU reports are that the small engines can be "anemic," especially with heavier riders, and that none of the moped models it tested could actually reach its top designated speed.

Rules and regulations regarding mopeds are finally beginning to catch up with the popularity of these little machines. As of now, most states have laws that apply to mopeds, and 38 states and the District of Columbia have special moped laws. Forty per cent of the "moped states" have no registration fee; the others set fees from $3 for two years (Massachusetts) to $12 annually (Illinois). Many of the states have chosen 16 as the minimum age to operate a moped, but 10 states allow 15 year-olds to operate one. Most of the moped states require operators to have valid drivers' licenses, and 15 states offer special moped permits for those who do not have any other type of license. Only New Jersey requires that drivers know

continued on page 12

Couple a pre-ride inspection with good protective clothing, and you're well on your way to cycling survival.

with their computer) to reconstruct motorcycle accidents nationwide. The information that the NASS teams generate will be made available to cyclists and safety people with the hope of producing better-educated, more skillful riders. An interesting sidelight to the NASS program is that the motorcycle industry is also heavily involved. Cycle companies rightfully figure that if they can make cycling safer, more people will want to participate. To Harry, though, the most important aspect of the program is that it will train local law-enforcement people in motorcycle accident investigation techniques.

"Right now," says Harry, "the police, quite frankly, don't exactly have a lot of sympathy where cycle accidents are concerned. And when you combine an attitude like that with the fact that they are *not* skilled cycle-accident investigators, you get gobs of false info being put into the system.

"Now, to be fair, asking a non-rider to investigate a cycle accident is like asking a guy from Mars to investigate

"Our people see cycle accidents through the eyes of the rider."

a car crash. He understands rocket ships and nuclear fusion maybe, but when you ask him to check out a car crash he says, 'Right . . . what's a car?' The same holds true for a non-riding accident investigator. Unless he's a rider AND a trained observer, he can't, for instance, estimate the speed of the cycle at the time of the accident by using wheelbase reduction factors (in which a cycle will collapse X inches for each mile per hour of speed). He can't or doesn't recognize the special type of mark a skidding cycle tire will make. He doesn't relate the contact conditions, the vaulting of the rider over the car, etc.

continued

"So, what are *our* qualifications, and what do we do exactly? Well, each of us is a specialist in some scientific domain, as well as being an experienced rider. We have specialists in psychology, physiology, medicine, motorcycle factors, environment, highway design . . . our people see the accident through the eyes of the rider.

"What we are doing with this study is to investigate cycle accidents, get the *true* causes, and use that information to come up with material that will help riders stay alive and unhurt. One of the reasons this study is so important is that, in the past, inaccurate information has given us false leads about cycle safety, and I'll give an example of that in a minute.

"Within a study area, or sample space (in this case, greater Los Angeles), we collect traffic accident reports . . . all of 'em, 100%. We call these "paper reports," that is, as reported by police documents. Then, in that *same* area, we go out and we sample the *real* accidents by a notification system we've set up with the police, fire, and medical people. We go immediately to the scene of the accident and (hopefully) get there before anything's gone or changed. We take a multi-disciplinary team and investigate that accident in the greatest depth, with over 1300 pieces of information for each accident.

"We then *compare* the traffic accident report info with the poop from our own on-scene, in-depth investigation to see what's good and what's bad about reports as they are written by people who are unfamiliar with cycles and cyclists.

"Some of the things we check on at the accident scene are the rider's cycle-riding experience . . . off-road or street, how much total time, how much on the cycle he's riding. His trip plan, if any, and where he's going vs. where he started. How long he's been riding during the trip he's now on. How *much* he wears a helmet . . . why doesn't he wear a helmet? What articles of clothing he's wearing and why. The cycle itself, number of miles, overall condition, type of tires and condition, and defects, flats, wobbles, etc. We check brake wear, and we pay close attention to modifications . . . we've found that modified cycles with extended forks, pull-backs, custom seats, etc. have a larger-than-normal involvement in accidents.

The findings: "We're finding some things that hadn't been brought out in any previous study . . . things that are *very* interesting. Now, one of the first things we look for is the number of tattoos the victim has. It appears that tattoos are a prime indicator of the risk-taking character of the individual. It seems risk-takers are also involved in a lot of things . . . single-vehicle accidents, felonies, suicides. This isn't a blanket condemnation of people with tattoos, it's just the plain truth!

"We've found that touring riders aren't involved in many accidents. Their bikes usually have fairings and are bigger, brighter, and easier to see. And since they don't usually commute in traffic, their exposure factor is 'way

"We gather about 1300

The dirt is a good place to learn to ride. Falling in sand is easier than hitting pavement. Sliding and skidding techniques are more easily mastered off-road.

(right)
One thing all studies agree on is that protective equipment will save your bacon. It's legal to wear while in uniform, too.

"Accident-involved riders don't generally wear eye protection."

separate pieces of information for each accident we investigate."

Prof. Hurt's study shows that police cyclists get knocked down just as often as civilians. The old rumor about dressing like a policeman and riding a cycle like the police use so cars will avoid you is just that . . . a rumor.

down. They tend to be more disciplined, mature riders, too, and that always helps.

"We've reinforced the old truth that intersections are where the rider is most likely to collect his piece of the farm, but we've also discovered that the biggest *factor* in cycle accidents is *exposure to traffic*. We used to think that lack of conspicuity was the biggie, and it still plays perhaps the second most important role, but if your exposure factor to traffic is high, you're definitely more likely to get bumped off your machine.

"Accident-involved people don't wear eye protection. The boy wonder is headin' down the street at 35 mph with no glasses, goggles, or face shield. He's just squinting away because of the sun or the wind. The next thing we know he shows up in our accident files. Maybe the wind blast limited his vision, or the sun combined with the wind, whatever . . . he still has lost his visual performance. He just doesn't see that nasty ol' mother trucker turning left in front of him.

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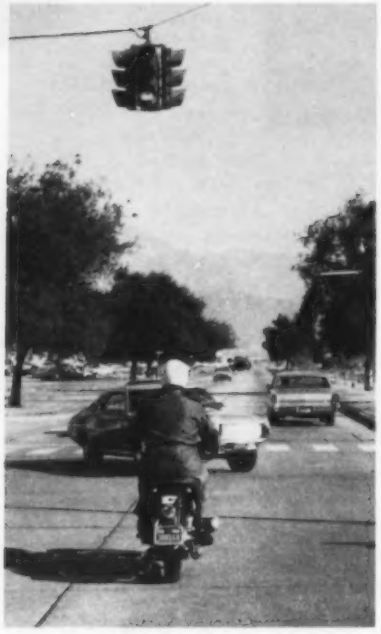
"One of the first things we check is the number of tattoos the victim has."

(left)
Can anyone think of a better argument for using leathers?

that happen never get reported, since they



Even though traffic exposure is the biggest *factor* in cycle accidents, the biggest *cause* is still a car turning left in front of the cycle from either the opposing flow or the lane on your right.

Touring riders don't get involved in many injury-producing accidents. They are more visible because of large, bright fairings, and they aren't exposed to much city traffic.

"I used to think that the only way I could be happy was to go off down the street wearing my $90 Bell Star full-face helmet . . . well, there's an awful lot of people out there with their $10 swap-meet specials on, and that $10 helmet is doing them an *awful* lot of good.

"People who wear helmets make out a whole lot better than we'd ever imagined, and the difference between no helmet and even a $10 special really blew me away. I'd always thought that it took a lot of helmet to do a little extra good, but it turns out that even a little bit of helmet will go a long way.

"Now, the guy that wears a full-face helmet, even a $20 one, is a lot better off. Remember, the typical accident we see is the boy wonder cruisin' down the street and hitting a left-turning car at an intersection. He vaults over the car and lands on his head and shoulder. If he lands on his chin and isn't wearing a full-face helmet, his jaw is thrust back, possibly splitting the skull or severing the brain stem. A full-coverage helmet can help prevent this type of injury.

"Since the intersection crash is the most common type of injury-producing accident, we looked at the prime cause . . . the driver just *doesn't see* the rider.

"An old saw used to be; if you ride a black-and-white Harley, wear a short black leather jacket, and use a gold-colored shorty helmet, people will stay away from you because they think you're a cop. Well, they might stay away *if they see you*, but our investigations prove that cops on cycles *get hit just as often as civilian riders*. The red lights can be on and the siren wailing, and some turkey will take him down! It's true!

"The whole problem of cyclists being hit by cars is that, truly, the car driver doesn't see the rider or his cycle. Why not? The car driver is thinking "watch out for cars, spelled C-A-R-S" . . . he's not *looking* for cycles. You see only what you're looking for, and unless an item has great 'conspicuity'

"At least half of the motorcycle accidents involve people who wear helmets and just get up and push the cycle to the curb . . ."

Helmets and eye protection will go a long way toward helping you avoid and/or survive a cycle crash.

it won't attract attention. It's a fact . . . bright-yellow jacketed riders with cycles having big fairings and running with lights on just don't get hit as often.

Military cyclists: "We've seen quite a few military people in our investigations, and it's been impressive to notice that those who have gone through the military base cycle courses have learned some very special things that've helped them a lot.

"For instance, we saw a guy from Norton AFB who crashed his 360 out on the freeway. He was wearing a helmet, because he thought that was a good thing to do. But he also had on a good heavy jacket, boots, and gloves. It really did save his soul in a lot of ways. So, base cycle courses do a *lot* of good.

"Of course, we've also seen many military people who think that the need for a helmet and protective clothing ends at the main gate. That's too bad, 'cause it's usually the short trips, like from base to your apartment, that get ya.'

Booze is big: "About 10.5% of the military cyclists we see have been in recent contact with booze or beer, and that's about the same as civilian involvement. About ½% have been using

continued

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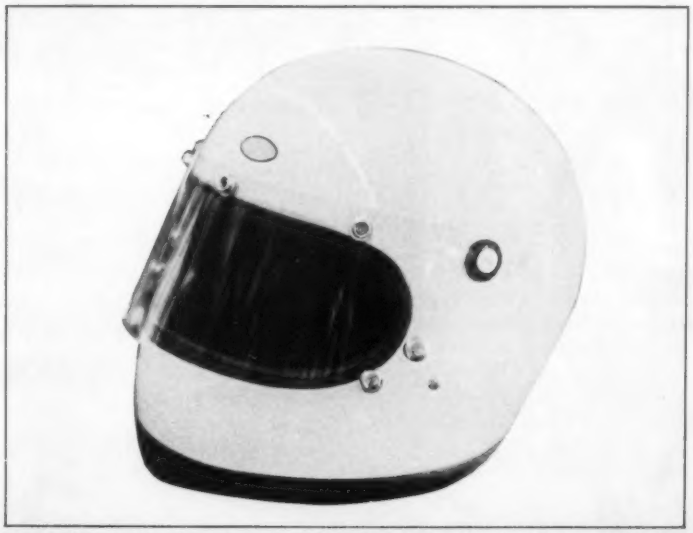
WARNING – SOME REASONABLY FORESEEABLE IMPACTS MAY EXCEED THIS HELMET'S CAPABILITY TO PROTECT AGAINST SEVERE INJURY.

An approved helmet will give you the best head protection, but even a $10 swap-meet special can help prevent fatal head injuries.



Here it is, folks, the #1 choice in head and eye protection! But even this fine set-up won't do you any good if it's sitting on top of the sissy bar and not your head.

An intersection doesn't always have to be where two main streets join . . . alleys count, too.

drugs which affect their riding performance.

"What a lot of people don't realize, though, is that alcohol involvement in *fatal* motorcycle accidents amounts to over 50%! It's beyond me how some guy can soak up enough alcohol to get his blood alcohol level up to around .20 or so and then go out and hop on his bike and think that everything's OK!

"You know, somebody once said that the worst thing ever invented for the cyclist was the electric starter! If a guy is all boozed up and tries to kick-start his BSA Gold Star, he's gonna break his leg! That's not too cool, I guess, but I think it's better than riding off into traffic without all your senses functioning!

"Modified cycles have greater accident involvement . . ."

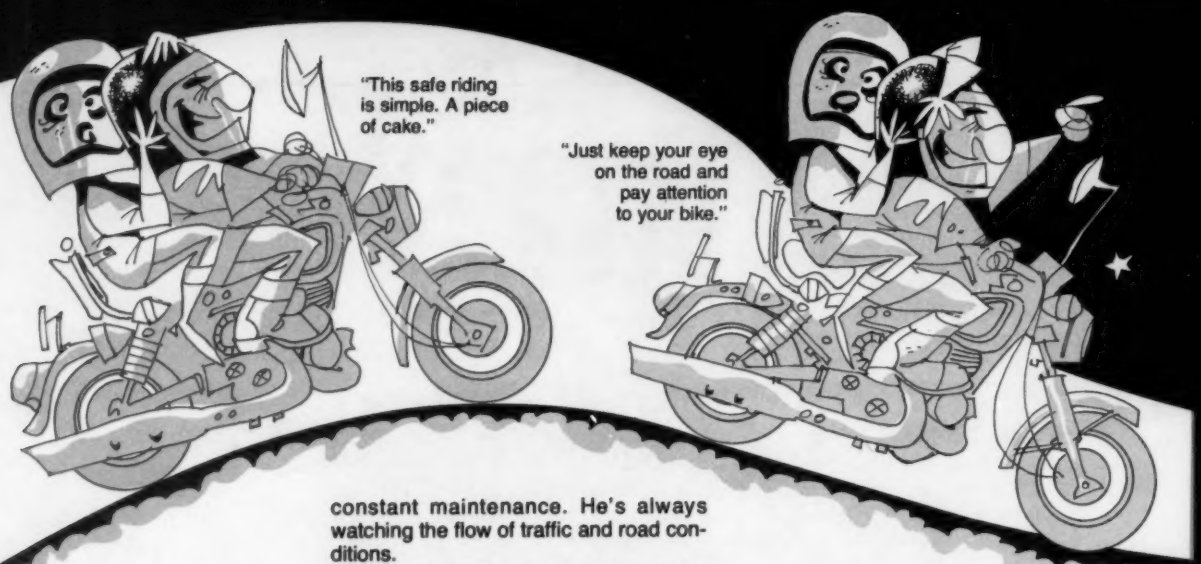
"I guess to recap the high points we've found in our study, I'd have to say:

- When you're learning to ride, go learn on a dirt bike. The new-guy-falls bit is easier on your hide in soft dirt as compared to asphalt. We see a real relationship, too, between lots of dirt riding experience and accident avoidance on the street. The street is no place to learn sliding on gravel.
- Use good personal protective equipment. I used to say, 'If you've got a $10 head, get a $10 helmet.' Now I say that even a $10 helmet will provide a million bucks worth of protection. A full-face, top-quality, approved helmet is still the best way to go, but almost any kind of helmet will help save your life.
- Get and *use* a high-visibility upper torso garment. Maybe streakin' along on your Yamaha wearing a Honda vest isn't your idea of cool, but #*@&, how cool is being hit?
- Stay away from booze, beer, or performance-altering drugs when you want to ride.
- When you approach an intersection, GET READY . . . 'cause sometime, somewhere, there's a car out there that's ready to write FORD backwards across your body."

In traffic, you're vulnerable because you can't be easily seen and because the car vs motorcycle "challenge level" is awfully low!

Wearing a full-face coverage helmet can help you keep that pretty face you're so proud of!

Prof. Harry Hurt is *not* your typical professor. When we talked to him, he had just swapped his helmet and Bultaco trials bike for the sunshade and was giving a motorcycle safety briefing to the students of a Safety Officers Class. Very outspoken man, this Prof. Hurt . . . read the article to see what we mean!



The arrival of winter finds many motorcyclists engaged in the rituals of storing their bikes until spring or bracing them for the cold weather ahead. Maintenance time conjures images of last summer's dusty ascent of Pike's Peak, the beauty of the Appalachian Mountains and past trips to Key West, Oshkosh or Tucumcari.

It is a good time to reflect on the adage that there are old bikers and bold bikers but not old, bold bikers. We become aware over the years that most accidents befall the young and inexperienced, or involve such factors as borrowed machines, drunk drivers or excessive speed. Countless trips down countless roads help convince us that we are skillful enough to avoid such pitfalls.

The complacence born of years and miles keeps all too many motorcyclists from growing old. We sometimes fall prey to that "one for the road" invitation; succumb to the urge to run the needle past 100; or just "take a quick trip to the corner drugstore" without benefit of adequate protective gear.

In other words, we have a tendency to rest on our experience, ignore the lessons born of thousands of road miles and take unnecessary chances that make us as vulnerable as the aforementioned "high risk" bikers.

During a recent tire-kicking session, a friend and I were discussing safe riding techniques when he suggested that the key word in motorcycle safety is DISCIPLINE. A disciplined rider uses common sense and experience *all the time*. He remembers the importance of constant maintenance. He's always watching the flow of traffic and road conditions.

Most experienced bikers know the basics of motorcycle safety. But we sometimes fail to maintain proper discipline. I'd like to discuss some of those basics. Hopefully they will educate newcomers to motorcycling and act as a gentle reminder to those who might become lax at times.

Before you flip the page, dismissing this discussion as dry, even boring, and certainly not fun, consider one very important point. Above all, motorcycling *is* fun! We don't ride motorcycles because they are the most practical means of transportation. We ride because we enjoy them. Discipline helps prevent accidents and accidents are *not* fun. Thus it stands to reason that a little discipline can keep the enjoyment in our riding.

Owner's manuals always include a page about "pre-ride checks" which many owners never read, much less put into practice. But it takes only a couple of minutes to make sure your lights, horn, brakes, instruments, chain, etc., are ready for the road. A minute spent checking out the bike can save a great deal of time later. (Ever been in the middle of nowhere at sundown only to find your headlight doesn't work?)

Do you make it a point to always use both your front and rear brakes, so that in an emergency that will be your instinctive response?

Do you replace tires *before* they are dangerously worn and make sure a new tube is installed? Tubes do get old and valve stems have been known to pull loose. As anyone who has ever experienced a flat at speed can relate, it is a frightening situation and one of the most dangerous faced by bikers. Personally, I feel more secure with a sealant in the tube. My first flat came at 60 miles per hour and I'm convinced the sealant gave me a few extra seconds to react properly.

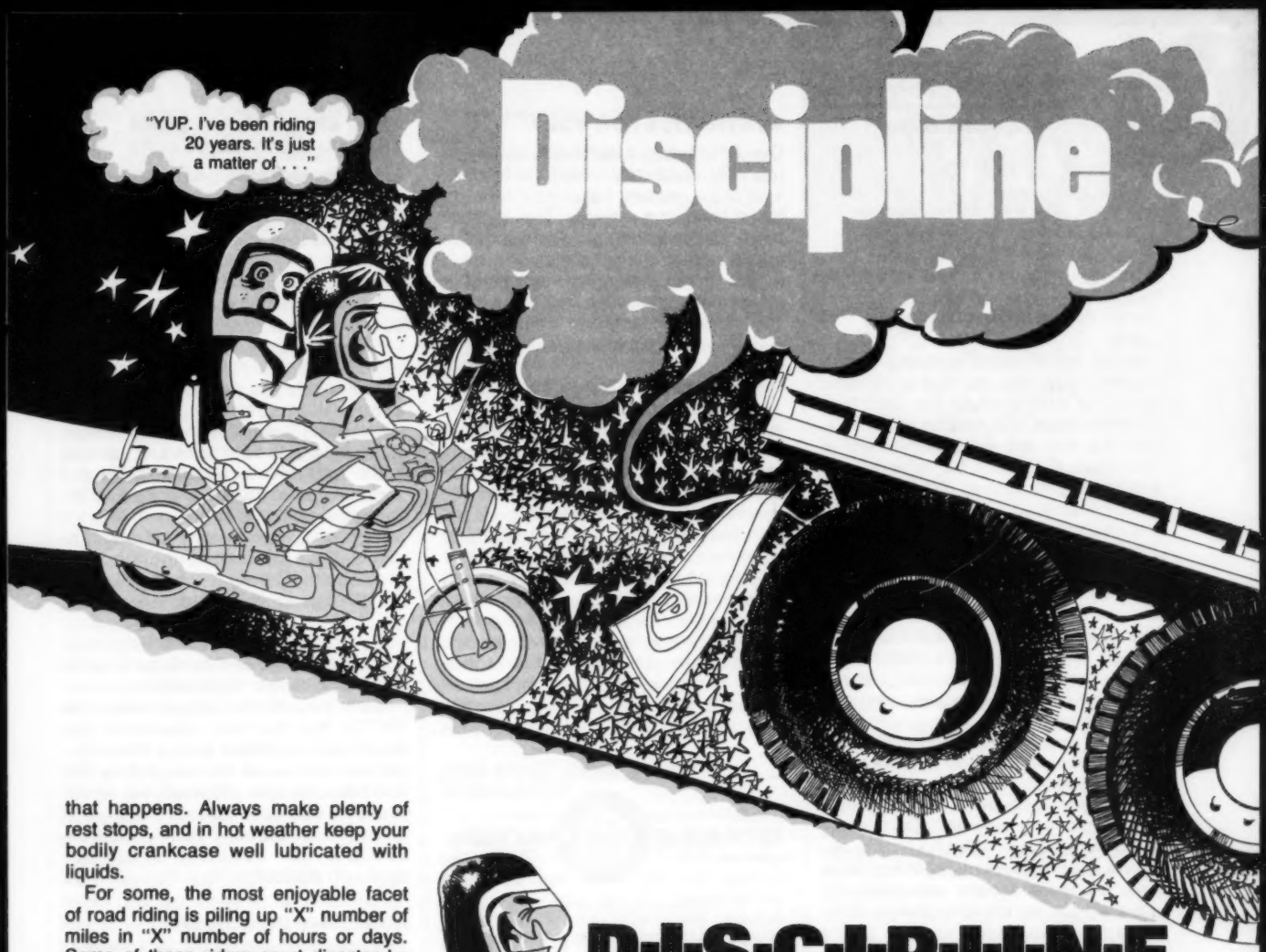
Are you prone to overloading—or misloading—your bike? There are two things to watch here. One is keeping the total weight of machine, rider and passenger within allowable limits. The other is to distribute that load so that there is adequate weight up front. And if you're like many travelers, you'll find you have more cargo on your return trip than you did on the way out. Keep that in mind when packing.

This subject always raises flak, but do you always wear a good helmet, even on short hops? I prefer a simple, pragmatic approach to the effectiveness of helmets. Just find a blunt instrument and hit yourself in the head. When you wake up, repeat the procedure with your helmet on. The point should be clear enough!

But motorcycle safety involves more than injury avoidance. It also encompasses the area of comfort. Riding in shorts, sandals, without a shirt, etc., can be very comfortable. On the other hand, it can lead to severe sunburn, as that pleasant wind blows past and covers up the symptoms until it's too late.

Those who aren't worried about sunburn may figure the chances of crashing are minimal, and that the comfort is worth the risk of losing a little hide. Their logic—their discipline if you will—suffers from shortsightedness. Granted, pavement rash heals and long pants won't save you from a broken leg. But have you ever had a cast on a leg which was missing half its skin? Or had a serious infection? Leather clothing, or even denim, can save you from such miseries.

Disciplined riders realize that those oppressively hot days can also lead to fatigue and drowsiness. Concentration, key to motorcycle safety, suffers when



D-I-S-C-I-P-LI-N-E

KEY WORD TO MOTORCYCLE SAFETY

by Dr. EUGENE ALVAREZ

that happens. Always make plenty of rest stops, and in hot weather keep your bodily crankcase well lubricated with liquids.

For some, the most enjoyable facet of road riding is piling up "X" number of miles in "X" number of hours or days. Some of these riders court disaster by zapping along at 70 miles per hour; stopping only for gas or a quick snack; for six, 10, even 12 or more hours. Then they grab a nap on a rest area picnic table and start all over again. I find it hard to believe that a rider can be rested and prepared for an emergency after 15 hours in the saddle and a three-hour snooze on two-by-fours.

The attraction of long-distance riding is undeniable. It is fun! But it should be the domain of experienced motorcyclists who use their common sense. If you don't fit the "experienced" category, take your time. Learn the ins-and-outs of touring. If you are disciplined you will become an old biker, and that means you have plenty of time to work up to a long day's ride.

Another area which is critically important to bikers—more so than for the four-wheelers—is road conditions. Potholes which produce an irritating thump-thump behind the wheel of a car can put a rider on his rear end in a hurry. The same goes for gravel, wet roads and the worst enemy of all, oil on the pavement. Be alert, especially when turning, cresting a rise or riding on unfamiliar roads. Bridges and railroad tracks should be approached with extreme caution.

Here's a "road condition" that may draw a few giggles, but a good many bikers credit it with some very hairy moments. The condition? Dogs! Trying to outrun a dog isn't always the best bet; particularly on a crowded residential street (which unfortunately is where the dogs always seem to be). I found that out (the hard way) when I tried to outrun a German Shepherd, which promptly "chowed down" on my left leg. I stopped, climbed off, shut off the bike and . . . the dog promptly wagged its tail and licked my hand! An alternative is an air horn, which sometimes startles a dog long enough to allow you to make good your escape. Air horns are valuable safety devices on the road as well.

continued

Eugene Alvarez, Ph.D., is a college history professor from Macon, Georgia, and has taught at military bases in Europe and Asia. He is a member of the American Motorcyclist Association and has been riding touring motorcycles for nine years. This article first appeared in the American Motorcyclist.

d-i-s-c-i-p-l-i-n-e

continued

While on the subject of animals, never trust deer, which react to emergencies with less common sense than an inexperienced biker. Slow down at deer crossings and if you do see a deer, ride by slowly and keep an eye on its movements. And remember, they move very quickly.

We've talked about watching out for the other guy. Now it's time to consider his task of looking out for you. Let's face it; motorcycles are smaller than most vehicles and are sometimes hard to see. Make it easy on the other guy by wearing brightly colored clothing, putting reflective tape on your bike and helmet and keeping your taillight lens clean. I personally favor burning a bike's headlight in daylight as well, although some disagree. In any case it is a safety measure you should consider before making your own decision. Above all, be wary at night when your own visibility is reduced. Expect the unexpected and you won't find as many surprises lurking on the highways.

Watch your speed! Riding 80 miles an hour may get you where you're going quicker. Then again, it can prevent you from getting there at all. Can you stop a bike in a hurry from 80? Think about it and back it down. Take the time to enjoy the sights and sounds of the countryside. Moderate speeds with brief rest stops will get you there on time, and the riding will be less fatiguing.

A few other "quickie" tips . . . Residential areas abound in potential dangers, from kids running into the streets to cars pulling out in front of you. Be very wary at intersections—including driveways—and watch the posted speed limits. That sunbathing blonde in the front yard probably won't be impressed by your full-throttle blast anyway! In heavy rush hour traffic, be particularly alert. Riding a bike may clear the cobwebs out of **your** brain, but half the people in cars are devoting half their attention to driving and the other half to mumbling about their "lousy day." When riding in groups, remember the accordian effect as the group speeds up. The trailing riders must go even faster to catch up, so don't force them to overextend their abilities or the laws. Never challenge an automobile for your right of way. Always remember that defensive riding is safe riding. Discipline yourself to always be on the defense. Anticipate potential accidents before they develop and refuse to be at the scene.

You may feel mine is an "old man" attitude. I'm not an old man yet, but I do plan on becoming one! I hope you'll join me.

SYNTHETICS FOR YOU?

Our article about synthetic lubricants (Apr '78) apparently tickled the fancy of a lot of our readers, judging by the number of letters we received. The question most readers ask is " . . . but synthetics are so expensive, isn't there some other magic potion that will give me better mileage but not cost an arm and a leg?" The answer to that is . . . yes and no. ARCO's new graphite oil will give you improved mileage, as will commercial preparations of $MosD_2$ (molybdenum disulfide), and certain additives containing teflon. BUT they don't claim to increase mileage as much as the makers of synthetics claim, and they don't provide the high-temperature stability and low volatility of the synthetics. If you drive just around town, in moderate temperatures, don't tow a trailer, and drive less than about 12,000 miles a year, then perhaps the graphite oil or other similar product is for you. However, if you subject your engine to heavy loads at high temperatures, do a *lot* of driving in a year, or live where the temperature gets well below zero, you may want to consider using synthetics.

DOUBLE CLUTCH

continued from page 2

how to drive a moped before it will issue a license.

In terms of safety regulations, the moped falls somewhere between bicycles and motorbikes. The National Highway Traffic Safety Administration (NHTSA) recently classified mopeds as separate from motorcycles, thus eliminating the extra safety, and extra cost, of the strict standards for the higher-powered machines. This means, for example, that at present only New York requires moped riders to wear safety helmets, although almost every safety expert recommends them.

The current Air Force position is to view mopeds more as bicycles than motorcycles. But until mopeds are specifically discussed in the Uniform Vehicle Code, each Air Force installation will be governed by the laws of the state in which they are resident. If the state defines the moped as a motorcycle, so does the Air Force.

For more information about mopeds, in addition to the article in *Consumer Reports*, write to the Moped Association of America, 1001 Connecticut Ave., N.W., Washington, D.C. 20036.

FEDS APPROVE HALOGEN LIGHTS; MUST BE SEALED

Quartz halogen lamps have been given the go ahead by the National Highway Traffic Safety Administration but, to the consternation of many, the safety agency has ruled they must be of the sealed beam variety.

A spokesman for the agency said the unsealed lamps would not meet the federal government's requirement that they be mechanically aimable.

The new lamps may be mounted on automobiles commencing the 1979 model year. They will increase high beam candle power to 150,000cp and the cost to the consumer by about $10. The old standards were 75,000cp and about $6 for a replacement unit.

Headlamp makers such as GTE Sylvania, Koito Manufacturing Co. Ltd. and General Electric Co. had petitioned NHTSA to make the change in the standard.

Ford and General Motors both have indicated they will make the lamps optional on several of their 1979 models.

Many persons had complained to the NHTSA that the more powerful lamps would make nighttime driving more dangerous because of increased glare but NHTSA concluded this would not be so. Studies it had done indicate only a 1.5% decrease in visibility when two cars equipped with 150,000cp headlamps approach each other.

ACCIDENT OR SUICIDE

The phrase "death wish" is a bit dramatic—but researchers have often speculated that fatal accidents may have a suicidal component. David Phillips, a University of California sociologist, has new evidence for this idea, at least in the case of automobile accidents.

An earlier Phillips study showed that suicides increase after a suicide has been publicized in the newspapers, and that they increase in proportion to the amount of publicity. Phillips has now analyzed the number of car accidents, before and after publicized suicides; the results, he says, suggest that "imitative suicides are disguised and recorded as motor-vehicle accidents."

STATEMENT BY RICHARD A. RILEY CHAIRMAN & CHIEF EXECUTIVE OFFICER THE FIRESTONE TIRE & RUBBER COMPANY

The Firestone Tire & Rubber Company has reached agreement with the National Highway Traffic Safety Administration (NHTSA) to voluntarily recall

approximately 7.5 million "500" and other steel-belted radial tires.

The majority of tires subject to free replacement are seven-rib 500 and TPC tires produced prior to May 1, 1976 and purchased after Sep 1, 1975. Five-rib 500s produced prior to Jan 1, 1977 are also included.

In addition to extending the effective date beyond the required three years, the company will replace tires purchased before Sep 1, 1975, at one-half of the current retail selling price at Firestone stores. Upon proof of purchase, the company will also authorize refunds to anyone who already paid a pro-rata adjustment price on tires now eligible for free replacement.

Firestone will begin mailing notifications as soon as possible to registered owners of tires purchased in the replacement market. The mailing will also cover owners of automobiles that were purchased with the tires as original equipment. Details of the recall will be advertised. Procedures will be established to schedule appointments for customers to obtain replacements so they will experience minimum inconvenience.

Owners of tires involved in the recall may continue to use them until replacements are available. As with all tires proper inflation and tire maintenance procedures should be followed.

GET READY FOR WINTER

Remember the winter of 1977-78? Many people would like to forget the blizzards that piled up waist-high snow drifts in their driveways and buried all but the tops of parking meters. In many areas earthmovers and even the National Guard were called into action. It seemed as if spring would never come.

Spring finally came, summer too, and car owners are now facing the inevitable again—winter is here. But the Automotive Information Council says you won't have to face winter car breakdowns if you winterize properly.

Test your battery's charge level. Check the interior water level of the cells, and inspect and clean the battery connections and cables.

Drain and flush the radiator and refill with antifreeze. Have its potency checked. Examine hoses, clamps and fan belts for wear.

Check snow tires for wear before mounting. Buy new ones if necessary. Maintain the recommended air pressure and check it often. Under-inflated tires get less of a grip on slippery surfaces and also cause accelerated wear.

Test and adjust brakes before faulty ones give you trouble on slippery roads. Check brake fluid, adding more if necessary.

Have an engine tune-up and oil change if it is time. Hold the air filter up to the light and replace it if it's clogged.

Check and replace windshield wipers if they are not clearing windows properly. Fill the windshield-washer reservoirs with an anti-freeze solution.

Spray a shot of dry lubricant onto the door latches and around the rubber casings to keep them from freezing up.

Check the front-end alignment by observing how the car holds its direction. Poor alignment can cause steering difficulty on slippery roads, as well as premature tire wear.

Check lights, defroster and heater to see if they are working properly. Examine the exhaust system and muffler for possible carbon monoxide leaks.

Finally, the Automotive Information Council recommends you put a scraper in the glove box and emergency equipment in the trunk of your car. You might consider a shovel, emergency flares and a bucket of sand, salt or an old rug to use for traction in case you get stuck.

Keeping your car in good shape will enhance your freedom of mobility.

FIVE MOST DANGEROUS HIGHWAYS?

The national Safety Council has released highway death figures for the first quarter of 1978. Longtime DRIVER readers know we don't go in for that sort of thing, but we *did* find the format of the press release very interesting. It gave the statistics *by highway*. Now, we can't say with 100% certainty that the following list includes the most dangerous highways in the country, but we do feel that there is a strong relationship between the death rate on a particular highway and your ability to travel it in safety. Granted, the rates for these roads could be caused by any number of things including weather, traffic volume, road resurfacing, or the amount of patroling, etc., but if you go by the bottom line, or number of deaths on a certain road, these highways certainly have to qualify as real killers.

If you *must* drive on any of these roads, do so with caution. If your travel plans call for you to use them, reroute your trip, if possible, to avoid them.

- Purchase Parkway, Kentucky
- West Virginia Turnpike, West Virginia
- Daniel Boone Parkway, Kentucky
- Atlantic City Expressway, New Jersey
- Richmond Expressway System, Virginia

Timely Topics

SPECIAL GLUES/SIMPLE FIRST AID

Technically they are called cyanoacrylate adhesives, but most of us know the special substances as Crazy Glue, Eastman 910 Adhesive, or some other name.

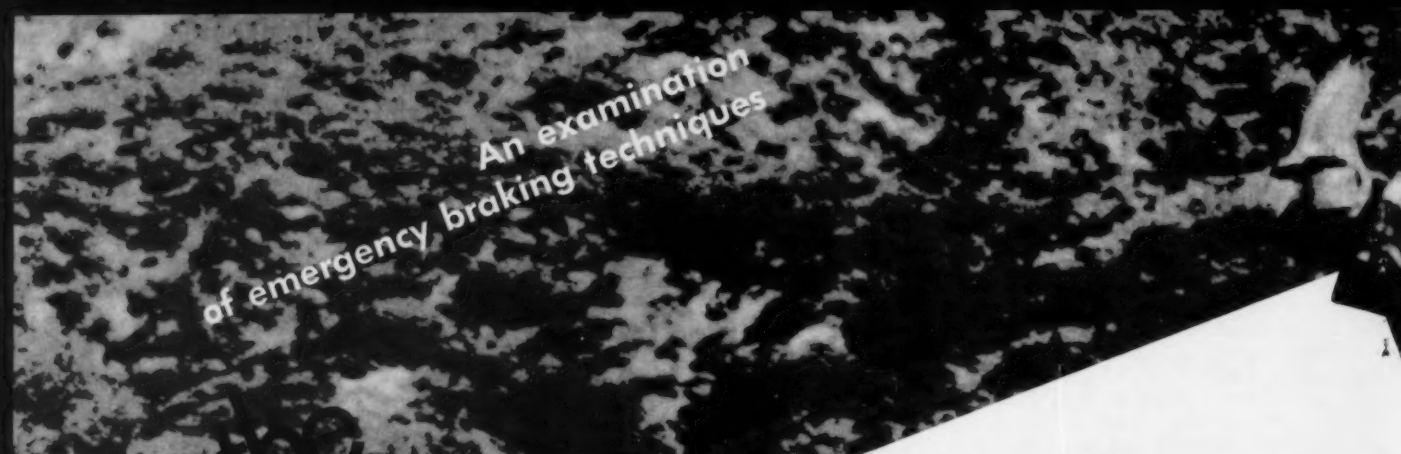
According to Firestone's *Non-Skid*, the glues are used widely in home and industry because they bond almost any clean, tightly-fitting surfaces together in seconds. Unfortunately, they also bond human skin.

"In the event of skin bonding, surgery should never be used to separate the bonded skin. Simple first aid procedures are the best treatment," according to Dr. Martin Hauser, vice-president of Loctite Corp.

He advises, "Do not try to pull the bonded surfaces apart with a direct opposing action. Immerse the surfaces in warm, soapy water and peel or roll the surfaces apart by using a blunt edge such as a spoon handle. Wash the adhesive off the skin with soap and water."

WARNING!

National Highway Traffic Safety Administration (NHTSA) has cautioned owners of "hatchback" vehicles to avoid driving with children riding in the automobile's luggage compartment, and to keep the hatchback closed whenever the engine is running. NHTSA says that an increasing number of reports of motorists driving with the hatchback in the "up" position has been received, and that the practice creates a risk of serious injury to passengers in the rear compartments of the vehicles.



An examination of emergency braking techniques

safest way to crash ...don't

If you'll pardon a preliminary bit of facetiousness, there are many ways of totally avoiding accidents with your motorcycle. You can leave it in the garage, ride it only when there is no traffic—or you can move to a less populated area . . . for instance the top of Devil's Tower, Wyoming. The point is that it doesn't take the average rider long to realize that this particular mode of transportation has some built-in hazards. But you bought that two-wheeled beauty to ride, and by golly, that's what you're going to do!

Most riders who have "survived" for any length of time on a motorcycle have developed their own particular brand of motorcycle safety techniques—many of which are darned good. However, it requires only a bit of inquiry to discover that some commonly-held concepts about motorcycle riding are based on misleading information. With that in mind, let's look at braking as a factor in avoiding impending crashes safely and see if we can alter some thinking. Stripped to the barest essentials, there are really only two methods of avoiding a potential impact situation:

1. Maneuvering safely out of harm's way.

2. Stopping prior to impact.

The first method comes under control movements and as such will be included in a later discussion on motorcycle control. Let it suffice for this paper to acknowledge that *whenever possible* the best and safest way to avoid an impact situation is to maneuver around it or away from it.

But what if this is impossible? Popular notions include two alternatives when maneuverability is eliminated as an option: laying the motorcycle down, and emergency braking.

"Laying it down" is one of the most persistent myths in motorcycling. I have often heard it said that there are two kinds of motorcycle riders: riders who have laid their motorcycle down and those that haven't. Maybe this is true. A two-wheeled vehicle certainly can be "laid down" easily enough. However, it seems to me that there are at least two separate categories here: one in which the act is done deliberately, and one in which it is not. Let's examine some of the ideas surrounding the deliberate act of laying a motorcycle down and leave the accidental lay down for another time.

Okay then! *Why* would you lay your motorcycle down? One hypothetical situation could be: "There I was tooling down this residential street doing about 35 miles per hour and some joker ran his stop sign at the intersection we were both approaching. What was I to do? I had to lay it down!" How about this one? "This fellow made a left-hand turn right in front of me. I don't think he even saw me. I had to lay it down, I was doing 40 miles per h and I certainly couldn't have stopp Here's another, "I was going dow

by ROBERT NICHOLS

Bob Nichols is no stranger to the pages of *Road Rider*, from which this article is reprinted with permission. His informative articles on safe riding techniques have been featured in several recent issues. He has been an active motorcyclist for more than 20 years. For the past 2½ years he has served as an instructor in the Motorcycle Safety Foundation's Advanced Riding Course at California's Saddleback College. He is currently gathering information for a Doctorate in Motorcycle Safety Education.

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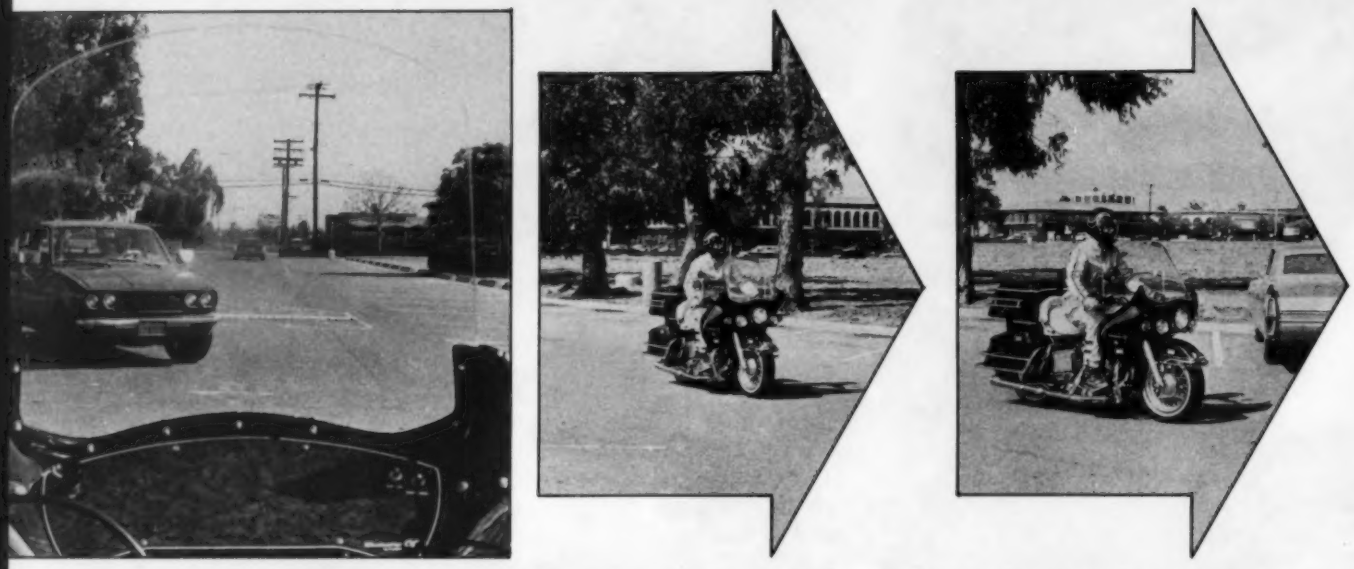


This full-lock braking sequence was set up to simulate an emergency stop under controlled conditions. Author Robert Nichols began the braking action at the measured 30 feet from the "left-turning" vehicle. Speed of the motorcycle at the beginning of the braking action was between 30 and 32 miles per hour. The simulation gains time/distance perspective when it is explained that the series was filmed with a motor-driven Canon AE-1 operating at approximately two frames per second at 1/1000. The sequence was photographed by Bob Livesay. The techniques employed by rider Nichols are explained in the text.

street, the traffic was pretty heavy in both directions. A dog ran out in front of the guy in front of me and he slammed on his brakes, coming to a complete stop. I couldn't avoid him to the left because of oncoming traffic and there were parked cars to the right. There was just no place to go so I laid it down." I'm sure you can think of other situations.

You've probably noticed that in these three examples I did not follow the dialogue through to a logical conclusion, i.e., crash or survival. In all three hypothetical cases it is entirely possible that the motorcycle rider missed the offending car and survived. However, if he *did* miss the cars it was not of his doing! The moment he laid his motorcycle down, he exercised his final option in controlling the destiny of himself and his motorcycle. Once the bike was on its side, there was no way he could have done anything else except passively ride the skid out.

Consider: When the machine is laid on its side, what is striking the road surface? The metal of the engine, the safety bars and the like. Think about how easily this metal will slide along the roadway. You've virtually converted your machine into a sled with metal runners. More importantly you have no control over this sled once it has been placed in motion. You can't make it stop, you can't turn it – in most cases you can't even get away from it!

So what do you gain from "laying it down?" Not much! If you're attempting to avoid an object would you rather approach this object on an uncontrollable sled with metal runners, or in a fashion where some degree of control can be exercised? I believe the rider in our dialogue would have had a much better chance of surviving the three critical situations if he had not lain his motorcycle down. As a matter of fact, I do not believe it is *ever* advisable to lay a motorcycle down deliberately in order to avoid an impact.

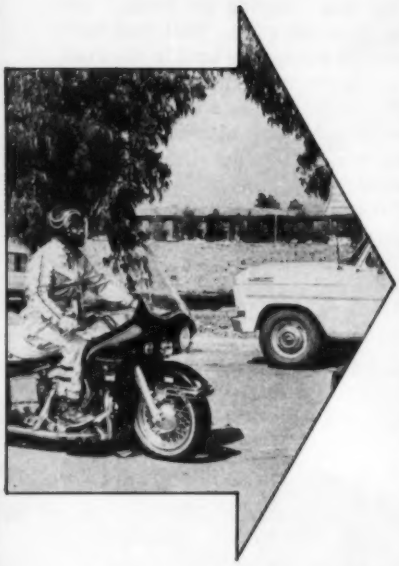
What is the alternative? Leave that machine on its feet! Your tires and your brakes are designed to stop the

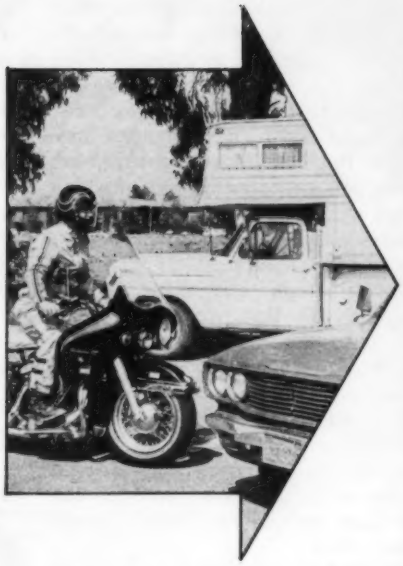
TABLE OF STOPPING DISTANCES

Miles Per Hour	60	55	50	45	40	35	30	25	20	15	10	5	0
Stopping Distance at Speed (in feet)	171	144	119	96	76	51	42	30	19	11	5	1	0
Difference in Stopping Distance between Speeds (in feet)	27	25	23	20	18	16	12	11	8	6	4	1	

Data reflects the formula: Stopping distance = V^2 divided by 30 μ, where V is the velocity of the vehicle in miles per hour; 30 is a constant; μ is the coefficient of friction of the roadway in percent (0.7 is the coefficient of friction for an average roadway surface.)

Fig. 1





machine . . . and they do it rather effectively if used properly and without panic. (It may serve to speculate here that the concept and practice of laying a motorcycle down seems to have originated many years ago when motorcycle brakes were far more inefficient than today's modern disc units. The idea may have survived because of outdated advice, reinforced by the number of accidental lay-downs which have been elevated to the status of "intentional acts" long after the incident. The fact is that brakes – these days – are better than sleds!)

Now that we've opted for using the brakes in critical stopping situations a few words about braking and braking distance are in order. Using the formula and data in Fig. 1, we see that stopping distance equals velocity (squared) divided by 30 times the coefficient of friction. You can determine stopping distances at different speeds under emergency, locked-wheel situations.

At 60 miles per hour it will take you 171 feet to stop your vehicle; at 55 mph it will take you 144 feet to stop, and so on. The interesting thing to note about the data in this table is the stopping distances *between* different speeds. It will take 27 feet to reduce your speed from 60 mph to 55 mph, 25 feet to go from 55 to 50 mph, 23 feet from 50 mph to 45 mph, and so on. Now look what happens to your stopping distances between different speeds as the speeds diminish! Whereas it took 27 feet to reduce your speed from 60 mph to 55 mph, it takes only eight feet to reduce the speed from 20 mph to 15 mph – the same five mph reduction in speed. So you can see that IF YOU STAY ON YOUR BRAKES and don't panic, you will stop faster as the speed diminishes.

This fact becomes extremely important if you realize that you don't have to come to a complete stop to survive a crash! If you can reduce your forward speed to approximately 15 miles per hour or lower, your chances of survival are very high. Yes, you may go bounding up against something and receive minor injuries, but existing evidence points to the fact that the vital portions of your body – excluding the head – can survive a direct impact of up to 15 miles per hour. Anything above this speed is generally fatal. (Somewhere in here there's a good reason for wearing a helmet. A 15-mile-per-hour impact against that critical orb might just be too much.)

There is another aspect to critical impending crash situations, and that is your reaction time. It takes you approximately ¾ of a second to react to a critical situation. If you translate this into distance traveled it will take you 1.1 times the speed you're traveling to apply any emergency action. If you're traveling 30 mph you will go 33 feet (1.1 x 30 mph) between the time you are aware of the situation and the time you take any action. So not only must you consider your stopping distance, you must consider your reaction time as well.

In the Motorcycle Safety Program at Saddleback College we like to print one underlying concept indelibly on the minds of our students. That concept is ANTICIPATION! Know where critical situations may arise and *anticipate* what could happen. Take for instance intersections. Statistics show that most accidents occur at intersections. Anticipate this and act accordingly. Slow down *before* approaching any critical situations. There is no better way to "decrease" your reaction time.

At this point still another factor enters the picture: the rider's trust in the emergency braking method and his ability to perform the technique. Tell you what you do. Consult the stopping distance table. At 20 miles per hour the table indicates that it will take you 19 feet to stop. Now go outside and measure off 19 feet from a wall. That's not much distance is it? Now stand at that 19-foot mark and imagine yourself traveling towards the wall at 20 miles per hour. Will you have enough confidence to hold onto those brakes even knowing full well you *can* stop before you go smack?

The point is that this idea of staying on the brakes may require some be-

continued

continued

havioral changes on your part. It is one thing to understand and accept a theory intellectually. It is quite another to internalize that theory to a point where you have confidence in it. There is only one way to make this happen.

Practice.

Only by performing a technique repeatedly until it is an ingrained procedure can it become a useable skill. But before you head for your favorite parking lot, let's examine what actually happens during a full-lock stop, and some of the things that make it happen. Knowing what to expect when you are placed in an emergency situation is more than half the battle.

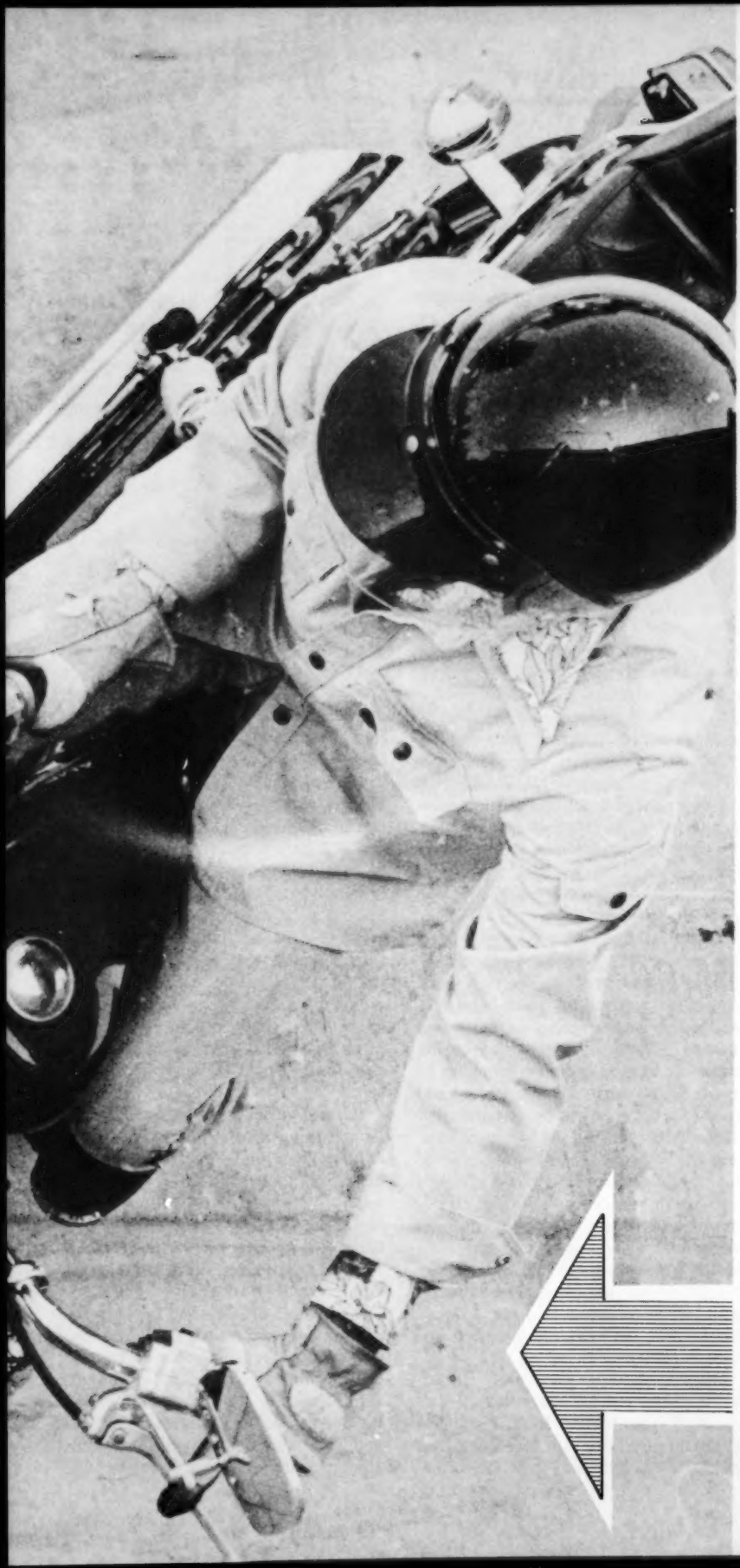
In order to stop your bike in the least possible distance, the front brakes must be used. As a matter of fact, 70 percent of the braking comes from the front brake. As we will see in a moment, you may lock up your rear brake on a motorcycle without losing control, but generally speaking the front brake is *not* locked up—even in an emergency situation. Contrary to what this would seem to indicate, this property of the front brake will actually stop the motorcycle in a shorter distance than the table indicates. The reason for this is that maximum braking force is achieved just *prior* to locked wheel stopping. As a result there is a safety margin built into the data in the stopping distance table, since the stopping distances given—and the formula on which they are based—are a reflection of locked wheel stopping. (But don't try to use that advantage in your emergency stops. Let it remain a safety margin.)

As a matter of fact, the major danger in using the front brakes in an emergency is that there are circumstances in which they *can* be locked up. If this should occur, you will lose forward steerage, the bike will buckle and you will go down unless you release those front brakes immediately.

On motorcycles which have a drum-type front brake, the front brake often can be adjusted at the handlebars to prevent front brake lock-up. But most road machines these days feature self-adjusting hydraulic actuated braking systems. Self-adjusting brakes are not supposed to lock—so they tell us—and under most circumstances they won't. But how about that exception where you are operating your machine in hot weather and the fluid in the forward braking system has expanded to a point where there is no free-play in the lever? If an emergency arises and you white-knuckle that front brake lever, you might wind up with twice the braking power and throw yourself into a front-wheel skid. Similarly, while applying normal front braking, you could hit some loose sand, gravel or oil on the roadway and the corresponding change in the coefficient of friction between the front tire and the roadway might cause a skid.

So what do you do in that emergency stopping situation? One thing you can do besides adjusting your brakes is practice a useful technique developed in the Motorcycle Safety Program at Saddleback College. Basically the technique consists of squeezing the forward brake lever with maximum pressure, releasing that pressure for a brief fraction of a second, then squeezing again. For illustration, let's assign the maximum braking pressure you can apply to the front braking lever the number 10, and no pressure zero. (Half pressure would be a number 5.) Do you have the picture? Now up pops an object in front of you. There is no way to avoid this object and you begin emergency braking. You would squeeze the forward brake lever to an 8 or 9, release it to a 6 or 7—and repeat this variation of pressure on the front brake lever until you have come to a safe stop. We like to call this "playing the brake," and it is most effective. This technique should be practiced—until in the event of an emergency situation you will "play the brake" as a normal course, thereby achieving maximum braking force while virtually eliminating the possibility of locking the front brake.

Basically front-wheel braking is a question of applying maximum braking force to the wheel via the front brake, and maintaining a straight line of travel. The rear wheel, however, exhibits a considerably different set of actions during an emergency stop.



As it travels along a given course, the motorcycle's position relative to the horizontal and vertical planes is called its attitude. As you ride down the road making left and right turns, the motorcycle is placed in leaning-to-the-left and leaning-to-the-right attitudes. Said another way, the bike is "rolling" to the left and "rolling" to the right as the turns are made. Not surprisingly this process is referred to as the motorcycle's "roll attitude."

Although you ordinarily will not call upon your machine to rise or descend vertically (unless you encounter a rather large, deep crevice), the motorcycle *can* operate to some degree in the vertical plane. Even though the elevation attained is limited by the length of the bike, the motorcycle certainly can "pitch" upwards during a wheely – and this "pitch attitude" is also experienced to a minor degree during hard braking when the front forks are depressed and the motorcycle pitches forward.

The third positional attitude is called "yaw." The motorcycle shares this particular attitude with its distant relative, the automobile. If you've ever undergone the hair-raising experience of being in an automobile which was in a locked wheel skid you will be able to visualize the yaw attitude. When this happens the vehicle is propelled along a straight line of travel, while the rear end "yaws" to the left and right of this straight line – with steerage being maintained by turning the front wheels of the automobile into the yaw along a line equal or parallel to the straight line of travel. In a locked-wheel braking situation, the motorcycle will act in the same manner.

continued

During emergency braking, the rear wheel will ordinarily lock and skid away from the centerline of the line of travel. At this point the bike is said to be in a yaw attitude. In addition the motorcycle is in a slight roll attitude away from the direction of travel. The motorcycle is surprisingly easy to control in this attitude by keeping the front wheel pointed in the line of travel (arrow) and staying on the brakes until the machine has come to a complete stop.

To understand why, I'm going to touch lightly on some physical laws first brought forth by Newton in his laws of motion. (Relax, it won't hurt much.)

As a motorcycle travels in a straight line, it exhibits – among other things – a tendency to *maintain* that forward motion along a straight line. As long as you perpetuate this forward motion with the throttle and the clutch, the machine will travel in the straight line unless some *outside* force causes its direction to change. This outside force may be provided by the friction of the side of the tire as the motorcycle is caused to lean and turn, or by the inertial force which results in a rear-wheel skid into the yaw attitude. As long as the forward force exceeds the outside force (e.g., friction of the rear tire striking the roadway in a yaw attitude) the machine will continue to mush forward along the straight line of travel – on the side of the tire!

(You may also have the idea if your motorcycle does go down you can push away from it and get out of harm's way. Not true! Newton again. You have the same inertial force imparted to you as does the motorcycle and you will tend to travel along the same general track as the fallen bike – another argument for staying upright and on the brakes rather than bailing out or laying it down.)

Of the three attitudinal positions – roll, pitch and yaw – yaw has the greatest significance when it comes to an emergency braking situation on a motorcycle. As a matter of fact it is the very act of locking up the rear brake which throws the bike into a yaw.

The underlying cause of the attitude shift of the motorcycle resulting in the yaw is the weight shift of the rider when he applies pressure to the rear brake lever. As the rider pushes down on the rear brake lever, his body is forced to the left of the motorcycle's centerline, creating a left yaw. As the rider steers toward the line of travel, the motorcycle's attitude will tend to change from a left yaw to a right yaw. This oscillation to the left and to the right will continue until the motorcycle comes to a complete stop. (The frequency of the oscillation and its intensity are governed by a host of variables: speed, surface conditions, etc.)

With practice under controlled conditions, this yawing motion of the motorcycle becomes surprisingly easy to learn to control. However at this point I must raise a very large yellow caution flag!

We have seen that during a yaw the motorcycle will be at an angle to the line of travel. Also during this time the machine will be in a slight roll attitude, leaning away from the line of travel. As long as the rear wheel is locked up and skidding in the yaw attitude, the bike can be controlled. However, *if you release the pressure on the rear brake pedal, allowing the rear wheel to turn even a few inches while the machine is at a yaw and roll angle away from absolute centerline of the line of travel, the machine will almost invariably flip in the direction of the line of travel, sending you and your motorcycle into a tumbling motion toward the object you are trying to avoid!* Not a pretty picture is it? The phenomenon is referred to as "high-siding" and it can only be avoided in a locked-wheel situation only by keeping those rear brakes locked up until you have come to an absolute stop.

Placing everything we've discussed into perspective, the total emergency braking procedure looks like this: Once you have committed your bike and yourself to an emergency locked-wheel braking situation, you will stay on the brakes as long as the bike continues to move. Your rear brake is locked up and your bike is yawing to the left and right of the line of travel. At the same time you are "playing" the front brake while steering the front wheel along a course equal to or parallel to the line of travel. If you continue this action you will bring the machine to a stop, hopefully before you strike the object you're braking for. At the very worst, your intention is to strike the object as a speed below the 15-mile-per-hour critical speed discussed earlier.

Now comes the hard part. Be advised that in order to carry this off successfully you MUST NOT PANIC! I know this is easier said than done. But practice, of both physical skills and mental anticipation, will help immeasurably. You should test your ability to stop at different speeds in trial situations. Set up a measured course in a remote parking lot and go over the procedures. It's surprising how quickly you can develop an understanding of speeds and stopping distances. Above all, if the real situation should arise – and it will – you will have confidence in your ability to stop short of utter disaster.

We all panic at some point. However, that point is very closely related to experience. I believe that if you know the facts – and have gained familiarity with the proper techniques through practice – that panic point can be diminished to the extent that you can retain control in an emergency braking situation and ride away from the critical situation safely.

Before we leave emergency braking let me bring up one more area where extreme caution should be exercised during an impending crash; that is, in turns. If you enter into emergency braking while in a turn, your machine will cease to travel the arc of the turn; instead, it will go into straight-line travel. Remember, emergency braking is locked-wheel braking and once you've committed your machine to this situation you *must* remain on the brakes until the machine has come to a complete stop. The only alternative is to release the brakes and what happens then? You and your machine may be catapulted along the straight line of travel in a very

unhealthy manner called a highside. So even in a cornering situation *if* you commit yourself to locked-wheel skidding in a turn, stay on those brakes. You stand a much better chance to retain control of your machine even though you may go over the curb onto someone's lawn or into the bushes.

Of course the key to safely negotiating a curve is to reduce your speed prior to entering the curve, take the turn from the high side of the curve to the low side of the curve, keep your eyes well up and into the turn and remember if you apply any braking the motorcycle will tend to right itself toward a straight line of travel.

If the braking action in the corner does *not* result in the rear wheel locking up, you can release the brakes while continuing around the arc of the curve even though you must compensate for the tendency of the motorcycle to straighten up and go into straight-line travel by turning harder into the turn. Practice your braking techniques in the corners.

Remember: emergency braking differs only in degree from normal braking. If the braking function does *not* result in the rear wheel locking up and skidding into a yaw attitude, you can release the rear brakes without highsiding. If, however, it is an emergency locked rear wheel situation you've committed yourself to – there is no option. You must stay on the brakes until the bike comes to a stop. With practice it becomes a valuable, life-saving technique.

This article has emphasized the use of brakes and critical anticipation as ways of avoiding crashes. However a reminder may be in order here: Your motorcycle is a very maneuverable vehicle. By all means, whenever possible, maneuver around harm's way. If you ride with your eyes up, anticipating traffic, you will generally have sufficient time to avoid most critical impact situations. In the case of the rare exception where emergency braking is your only alternative; be prepared, then do it the right way . . . the safe way.

(Road Rider *Magazine is available by subscription only. If you wish to know more about* Road Rider, *write to them at P.O. Box 678, South Laguna, CA 92677. They will send you a complementary copy.)*

automotive
painting
part 2

The two final steps . . . masking and painting

You've taken out all the dents and dings . . . you've finish-sanded until you thought your arm was going to fall off . . . you've metal-prepped and primered your trusty steed . . . and you're ready for that last step, the PAINT! Now, let's get that car masked and that paint sprayed on so we can see the results.

Masking: The Lone Ranger wore a mask to protect his identity. Your car needs a mask to protect it, too. Unfortunately, one of the biggest disadvantages to spray painting is overspray, that portion of the paint that doesn't go onto the surface you want it on. Overspray is no problem though, when you mask your vehicle the right way.

Areas that you don't want painted, such as chrome, glass, and different colored body panels, are protected by masking tape, masking paper, or a combination of the two.

Use Quality Products: Good quality masking paper will not permit paint to penetrate or seep through to the surface it protects. Masking paper is also capable of withstanding rough handling, and it contains a small amount of "stretch" which allows it to be fitted to slightly curved edges. Good paper will not scratch newly painted surfaces either. Newspaper *will not* meet any of these qualifications, so don't even *think* about using it!

Masking tape must adhere easily to both painted and unpainted surfaces, and equally important, it must be easily removed from surfaces without leaving a portion of its adhesive behind. Good tape will also remain on a surface even

continued

Part of the prep for any paint job is making sure that there is *no* wax or silicone residue left on any surface.

if it gets wet, like during wet-sanding operations.

If your base auto hobby shop has a paint shop, chances are it also has a dispenser for masking paper. This dispenser is nothing more than a stand which dispenses masking paper with tape already attached to one edge. As the paper is pulled from the roll, tape is automatically applied to one edge, with one-half of the width of the tape applied to the paper and the other half free. While not a must-have, this little goody makes a masking job go faster and easier, and lessens the chances for masking errors.

Masking rules: Masking tape, or tape/paper combinations, should only be applied to clean, dry surfaces which are free of silicone polish, rubber lubricants, dust, and grease.

Unless you're masking curved surfaces, the tape shouldn't be stretched. Just place it on the surface and press down gently, making sure that the edge of the tape, as well as the center, adheres to the panel. If the edges aren't sticking, paint can seep under the tape.

If you have a choice, tape shouldn't be applied or removed when temperatures are below 50 degrees F. Not a matter of choice is when tape should be removed . . . you've gotta wait 'til the paint is dry, not just tacky. And when you do remove it, pull it away from the surface at a 90-degree angle.

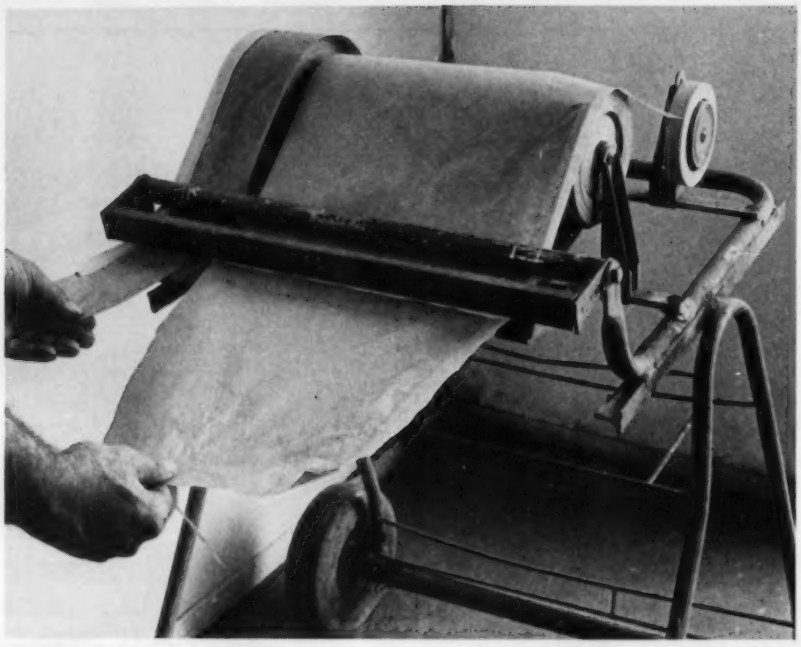
Also, tape should be stored in a cool, dry place, and shouldn't be left on a radiator or other hot surface.

Masking technique: Although the photographs will show you most of what to do, there are a few tricks that we'll briefly cover here.

■ **TRIM:** When you're doing trim, door handles, hood emblems, etc., you usually don't need paper, just tape. Select a tape which is wide enough to cover all or most of the part with a single pass. If more than one tape strip is required, don't forget to overlap the strips and seal them firmly to prevent paint seepage.

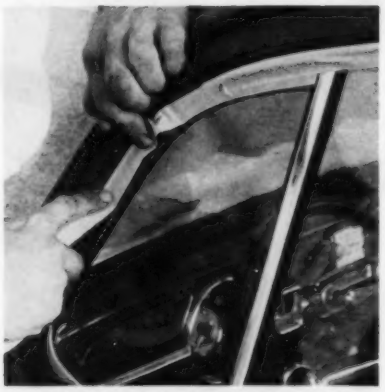
■ **WINDSHIELD:** You usually need two or three sheets of paper. Start with the lowest portion of the windshield and work up. The same goes for window glass too.

■ **BODY PANELS:** If you're just refinishing one panel, or if you're doing a two-tone job, you'll need to mask large areas. The trick is to select paper (or cut it) slightly wider than the panel to be covered. Attach tape to one edge, and apply the upper edge to the panel. Then crease the paper to the needed width and tape into position.



A taped-paper dispenser will make the masking job faster and easier.

Masking tape should be applied firmly, but not so tight that it stretches.



Before you mask glass, tape an outline (top) . . . then, tape the masking paper to the outline mask.

■ **UPHOLSTERY:** A professional paints the door jambs as well as the outside of the doors. But for this you need to mask off the upholstery. Use a narrow strip of masking paper about 10 feet long. Start at the outside lower corner and continue on around in a single operation. Follow the same route for the door frame, if necessary, and just to be sure, cover the seat, seat back, and carpet, too.

■ **HEADLIGHTS:** For headlights, use a piece of paper about six inches wide and long enough to reach about three-quarters of the circumference of the light. Place the tape along one edge of the paper so that one-half of the tape is exposed. Place the taped paper at some point on the lamp rim and run the paper on around. Then take a second piece of paper and use it to fill in the gap. If you've done it right, the result should be roughly cone-shaped. Twist and fold the cone against the lamp face. Then tape the fold flat against itself.

■ **WHEELS:** Listen up, all you little homemakers out there . . . to do wheels, you've got to make an apron. Seriously, masking circular surfaces is tricky, but if you use an apron mask you'll prevent the mask from buckling and/or wrinkling. Cut a length of masking paper about six inches wide and as long as the wheel circumference. Then, make a pleat about ¼-inch deep by crimping both edges. The pleat should be the full width of the apron. Press on, and pleat the whole piece at about four-inch intervals. Apply the mask to the wheel and fold the untaped edge so that it forms a cup shape out of the mask. When you spray, hold the gun opposite one side of the wheel and spray to the other side.

■ **ANTENNA:** Simple . . . just use a length of cardboard tube (like you find on coat hangers).

Spraying the paint: In the last installment, we covered spray guns. In case you missed it (or, like a bad person, used it to mask your windshield) we emphasized that a good spray gun, clean and in excellent working condition, is a must.

The guns used in auto body refinishing have two manual adjustments which must be correctly set to get a paint job that looks like a mirror instead of a soft candy bar. These two adjustments are the spreader adjustment valve (for side port control) and the fluid adjustment device.

The spreader valve controls the supply of air to the air horns on the air cap. If it's shut all the way off, the resulting paint pattern would be round. As you gradually open this valve, air flows to the horns and changes the spray pattern to an oval. This allows you to select a pattern and a pattern width to suit the job. Remember how to get this oval pattern, as that's the one you'll be working with the most.

The fluid adjustment controls the amount of paint coming from the gun. When it's fully closed, no paint flows . . . fully open, just the opposite, paint everywhere. With this adjustment, you select a setting that will give a proper paint flow for the job you're doing.

Air pressure: The air pressure used to make the gun operate will vary with the thickness of the paint you're using and, to some degree, with the *type* of paint, whether lacquer, enamel or acrylic. Gun air pressure is adjusted by a regulator which should be part of your air supply system.

Up front, the correct air pressure is really a matter of experience, so use an old piece of cardboard and shoot a variety of pressures and pick the resultant pattern/pressure that suits the job you're doing. Remember though, the pattern can also be adjusted by the spreader valve. What you're looking for is a pattern that will cover a fairly large area at one time, yet not so wide as to be

continued

If you select masking paper of the proper width, you can mask surfaces with one sheet of paper.

When masking trim, cover ends or complex curves, and then do the rest with as few pieces of tape as possible.

This sequence, shot with a motor-drive camera, shows how the gun should remain the same distance away from the surface during a paint pass. Always work parallel to the surface.

wider than the surface you want to paint.

Air pressure that is too low will result in under-atomized paint, which shows up as either a rough finish or as "orange peel." Too high an atomizing pressure will result in a "dry" spray and can also cause orange peel because the paint won't flow out. A good ballpark setting will be 50 pounds in a range of from 30 to 60 pounds. Remember, if your air pressure is limited for some reason, a pressure-feed system requires less air to function as opposed to a suction-feed set-up.

As you adjust the gun and the air pressure to get the pattern and the paint flow you want, check your practice sprays for signs of spitting. Spitting is caused by dried-out packing around the material needle valve, allowing air to get in fluid passageways. To cure it, just loosen the nut on the air valve and juice the packing with a little light oil. If spitting persists, check for dirt between the fluid nozzle seat and body, or for a loose fluid nozzle.

Distance: One of the most important things to get right is the distance from the surface to the gun. For synthetic enamels, try about eight inches, maybe as much as 10 inches. For lacquers, ballpark figures would be from six to eight inches.

If the gun is too close to the work surface, the paint will go on too "heavy" and could develop sags. If the gun is too far away, you'll get a dry, sandy finish. Once you find the right distance, hold the gun there for the entire length of the stroke. Imagine looking down on yourself from a point on the ceiling. You shouldn't see a fan pattern . . . you should see the gun going in a straight line parallel to the work. If the gun is held at an angle (like at the end of a stroke when you don't work parallel to the surface) you'll get streaks, sags, and runs.

Always try for a wet coat. Use slow, steady strokes across the surface from one edge to the other. Also, overlap each stroke about 50%.

Stroke it!: When you're doing a panel, begin the stroke past the panel. Then pull the trigger when the gun is opposite the start of the panel. Move the gun across the surface (remember, parallel to the surface) and release the trigger at the end of the panel. BUT, continue the stroke a few inches before reversing. This will assure full coverage without overspray.

Another little trick to consider is banding the panel. "Band-in" the *ends* of the panel with a vertical stroke, then spray the surface horizontally, triggering the gun at the beginning and end of each stroke. When the edges have been banded, the bad habit of whipping the gun is controlled since the banded surfaces act as a good signal to trigger and stop spray.

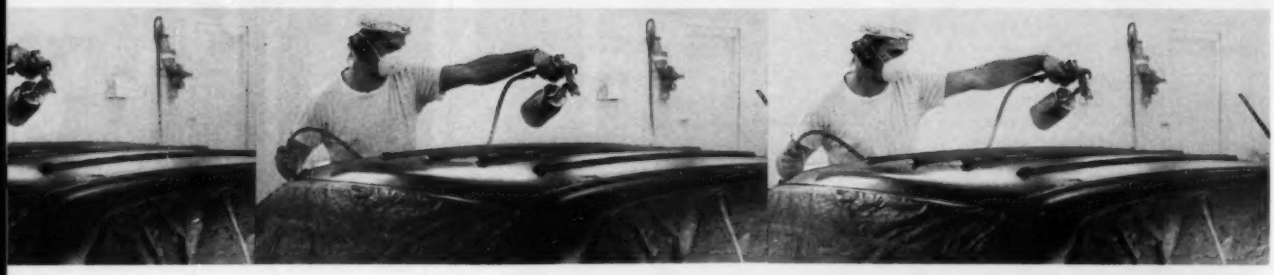
The stroke itself must be smooth and easy. Slow enough for the correct amount of paint to be deposited, but fast enough so as not to cause sags or runs from too much paint. Again, overlap the strokes by about 50%.

When spraying a hood, trunk, or other wide horizontal surface, always start at the side near you and work to the far side. This is particularly important to remember when working with lacquer. If you do it this way, any overspray will land on a dry surface. Overspray landing on a wet surface will cause a sandy-looking paint cover. If a pressure gun isn't available, the suction gun can be tilted slightly to be as near to a right angle to the surface as possible.

Paint sequence: The painting sequence is important. First do the hidden areas, door jambs, hood edges, and inside the trunk lid. You can leave the doors open slightly to avoid sticking. Then go to the exterior in a sequence like this: passenger side roof, passenger door, passenger side rear fender, trunk, driver's side rear fender, driver's side roof, passenger side front fender, hood, driver's side front fender, and driver's side door. Most pros prefer to do the roof one-half at a time as they work around the car. Use a pressure of about 20 psi when doing the door jambs, then go back to the paint manufacturer's specs for the rest of the car. Again, don't work into dry or semi-dry areas . . . that'll cause air streaks in the finished job.

Spraying temperature: All paints have a temperature at which they are happy. Go too much higher or lower and the finish will suffer. Too cold, and the paint will be thick and heavy . . . too light, the paint will be too thin. The ideal temp for most painting is around 70 degrees F. Painting materials and equipment should be stored at temps between 70 and 85 degrees F. The same holds true for the surface temperature of the car to be painted . . . you guys at Williams AFB or Ft. Lewis will have to use shade or heat lamps!

Techniques: Just before spraying the color coat, all the little nooks and crannies where dust and/or water can collect should be blown out with low-pressure air (don't forget your safety goggles). Then all surfaces should be carefully wiped with a tack rag.



If the finish coat is nitrocellulose lacquer, the usual procedure is to spray three or four double coats thinned as per the maker's specs. Allow each coat to flash (shiny external thinner to evaporate) before applying the next coats. Gun pressure will be about 40 psi, maybe 45 psi. Allow to dry overnight and then hand rub with polishing or buffing compound. Polish (dry buff) with a polisher using a lamb's wool hood on the disc. Allow 30 days for lacquer to harden before waxing.

If you're using acrylic lacquer or acrylic enamel, many paint makers recommend that after wiping with the tack rag, one or two coats of special sealer should be applied. When that has dried, three or four wet double-coats of acrylic enamel are put on. In hot weather, you may have to add a retarder to the paint to aid leveling and prevent blush (which is when the paint takes on a grey or white cast while drying). Allow each double coat to flash before applying the next coats. Most acrylics require at least four hours drying time, but overnight is best when you can swing it. You can wax acrylic after 60 days, and since it's so hard, polishing isn't normally required.

If you're working with enamel, the usual method (after the primer/surfacer has been applied) is to do the entire area with one medium coat of primer sealer. Blow out the nooks and crannies and wipe the whole thing with a tack rag. Spray the finish enamel, but be sure that the enamel is thoroughly stirred and mixed with the correct amount of reducer. Spray a medium first coat, allow to dry, and spray a full second coat.

Some paint makers say to spray one full panel at a time, applying two full

continued

When working large, flat areas like a hood, start the stroke at the edge nearest you and work toward the far edge.

If you aren't going to paint the wheels, make up a cloth or plastic wheel cover and move it from wheel to wheel.

A surface like this is called a medium wet coat. Work carefully on vertical surfaces to avoid runs or sags.

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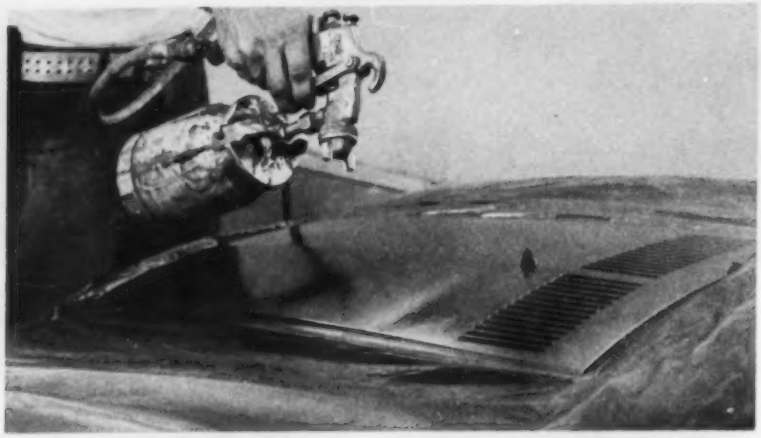
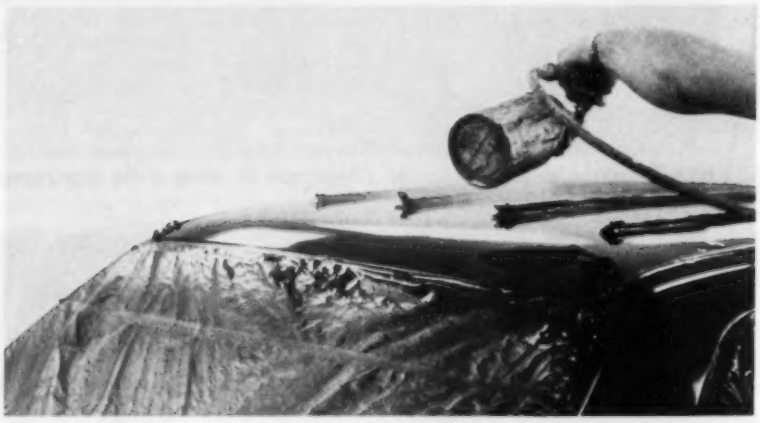


Look closely at the center of the photo . . . the lighter areas are where the paint is "flashing" or where the wet thinner is evaporating.



If you're working with enamel and your last wet coat looks like this . . . you're on your way to a great paint job!

wet coats to each panel, one coat immediately following the other. Metallic colors may require an additional coat, actually a mist coat.

Pressure for spraying enamel is around 65 psi when using a regular siphon gun. The mistake most amateurs make with enamel is putting too heavy a coat. A thick coat of enamel is no more durable than a normal coat, and is sometimes even less effective. Two correct coats of enamel will usually hide any color.

That's all folks: It took us three issues to tell you about auto body repairing and painting, but it'll only take you a couple of weeks of after-hours effort to get a superior paint job over good metal work. Remember, work slow and easy, keep things clean, and don't move on to the paint unless the surface is right. Experience is still the best teacher, but if you want a little more info before you plunge into getting that '55 Buick that your brother totalled back into shape, try reading Petersen's *Basic Bodywork and Painting*, or *Auto Restoration Tips & Techniques*, by the same publisher. They go into a lot more detail than we can here, and they're written at the enthusiast level and not for the pros.

If you pay attention to detail and have patience, your car will get a paint job that'll lend a whole new meaning to the phrase "SHINE IT ON"!!!

DRIVER wishes to thank S&M Auto Body of San Bernardino, Calif., for their assistance with the preparation of this article.

Backfire
LETTERS to the EDITOR

"BITS AND PIECES"

I have enjoyed your magazine since its initial publication. You express safety in an intelligent interesting format.

I must add a comment to your article "Bits and Pieces" in the Sep '78 issue. I have recently been transferred to the San Antonio area and your article must have been written from here. When the light goes green, you better not zoom out across that intersection! I guarantee you will end up with half a car. I asked one offender why he went through the light when it was red. He replied blandly, "It was green." If you're coming to San Antonio, memorize "Bits and Pieces" and save yourself an accident.

CMSgt John W. Petrie, USAF
HQ AFCOMS/SQV
Kelly AFB, TX 78241

BASE MOTORCYCLE CLUBS

In a recent issue (well, this year, anyway!) of DRIVER you had a letter from James Blanchette who is in the USAF down in Bossier City, Louisiana . . . and is connected with a motorcycle club there. In the letter he asked about other motorcycle clubs and I thought I'd write today to ask if it would be possible for you to send me the mailing address of any other clubs that you might have available?

I am from Chicago but have been living in Europe for quite some time now. I have a motorcycle repair shop here and if any of the club members happen to be traveling this way, on a vacation, etc., I'd always be glad to talk to them.

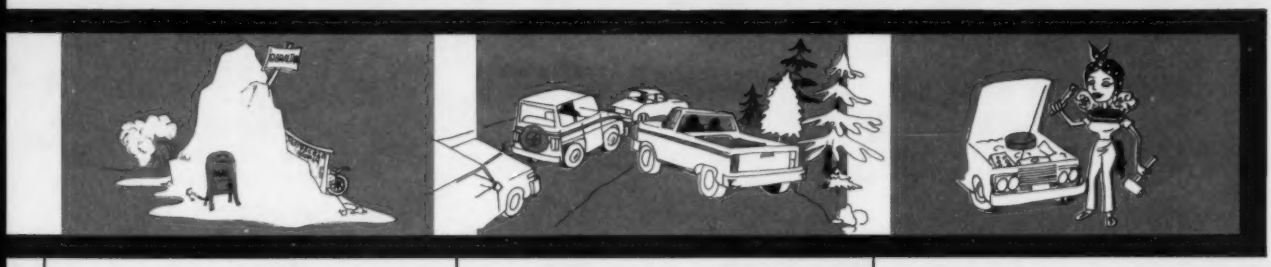
Mr. G. Alec
Conrod Motorcycles
P.O. Box 293
Gibraltar
Europe

Well, how about it, base motorcycle clubs? Why not drop him a line?

REQUESTS FOR ARTICLES

I would greatly appreciate a copy of the following past articles: (1) "Ride Sagely" (Jul/Aug 1975), and (2) "The Safest Way to Crash . . . Don't" (Sep '77).

I greatly appreciate your articles on motorcycle safety—they are the only available. Unfortunately, all cycle-related magazines don't carry such articles



which is a shame (a deathly shame). Just keep them coming. I love it!

Capt Ralph Porter, USAF
Box 3377
Sunnyvale AFS, CA 94086

Requests for these articles have prompted us to reprint them (Nov and Dec '78). DRIVER has published many motorcycle safety articles, but we think these are the very best.

TURK

In your Sep '78 issue, inside cover, you start off with ridiculing Turk's method of trying to get some place on our modern freeways because he passes on the left, right, and tailgates other cars before passing.

Every so often I read a few articles about a driver like Turk and myself, who are basically the same.

My comment or gripe is why are comments always about this type of driver? Why not "get down" on the drivers that cause him to drive as he does? If you would go after the other drivers and have them heed the California state law as posted all along the highways and freeways *"KEEP RIGHT EXCEPT TO PASS,"* this type of driving would not exist.

Those people who get on the freeways and plant themselves in the fast lane and refuse to move regardless of whatever speed he or she may be doing, even with a courteous honk of the horn or flash of headlights, should be taught when they obtain their driver's license to obey the rules. When a driver gets directly beside another car and acts like Siamese twins and will not move over, even if holding up traffic, he must, as the law states: *"KEEP RIGHT EXCEPT TO PASS,"* if not, this person should be criticized for his lack of concern for the other driver.

Also, on a two-lane road, if you have more than five cars behind you, you are required by law to pull over and let them pass; then proceed when they have passed, without holding up more traffic. This is very seldom practiced by sightseers or the like.

Let's get after these drivers! If this type of driver was educated to the law and took heed, then I don't think you would have very many drivers like Turk and myself.

We have the highway patrol to educate the speeder or the reckless driver. All the other driver can do by holding someone up on the freeway or the highway is to make them irate and therefore unable to get where they are going; thus they start snaking their way to the front where they can proceed to their destination, even with the possibility of danger.

NOT EVERYONE IS ON THE FREEWAY TO SIGHTSEE!!

Please note your photos of Turk inside the cover: In the fast lane of the first three photos is a pickup with a small car behind it—possibly tailgating and then beginning to pass to the right. Note also that same small car in all the other photos.

In other words—*"KEEP RIGHT EXCEPT TO PASS"* and you won't have the tailgating and passing on the right.

TELL BOTH SIDES OF THE STORY!!

The one who practices what he preaches,

Mr. D. V. Oberschlake
21820 Burndale
Sonoma, CA 95476

Even if you are traveling at the legal limit, you must move out of the fast lane of a freeway if a driver behind you wishes to pass. The fact that he is exceeding the speed limit is not your concern. It is also true that you must pull off a two-lane road if your slow pace is making traffic stack up behind you. This often happens on mountain roads, and pull-outs are provided for precisely that purpose. Naturally you cannot pull off until it is safe to do so. The road is safest when all traffic is moving at about the same speed.

We don't endorse Turk's driving style, but it's true that the driver who boxes you in, or keeps you traveling up-hill so slowly that your engine heats up, can make you so mad you forget common sense.

MORE ABOUT TURK

Your photo feature of Turk driving on the freeway in the Sep '78 issue is very, very interesting.

Although these photos were posed, had your photographer been traveling the interstate highway system in the Tidewater area of Virginia, he would get the real thing. Driving such as Turk is doing is standard practice here, especially the east-west traffic to and from the Norfolk Naval Base and Air Station during rush hours.

During a 24-year plus career in the Air Force, I have driven in some very interesting countries and cities. Thailand, Philippines, Spain, France, Germany, England and most of the United States and parts of Canada and Mexico; yet never have I encountered drivers like those here in Virginia.

Use of turn signals, if ever, appears to be an afterthought as the driver is in a turn or completing a lane change. Making right-hand exits from the center lane of a three-lane expressway is no challenge; here they make those exits from the far left lane.

It is my contention the State of Virginia should sue all automobile manufacturers for failure to include signal lights on cars sold in the state.

Seriously, yours is a great magazine and it is hoped educational, although those to whom such articles are addressed rarely pay attention.

MSgt Aaron M. Williams, USAF
Senior Editor, PROFILE Magazine
DOD High School News Service
Building X-18, Naval Station
Norfolk, VA 23451

WOMEN DO IT TOO!

I am a backyard woman mechanic. I have long been a fan of Volume I and have told other friends who work on their cars about it. This week I received Volume II from the Consumer Information Center, Pueblo, CO 81009.

I helped a girlfriend time her car and Volume II was a useful guide for us.

What other Volumes are available?

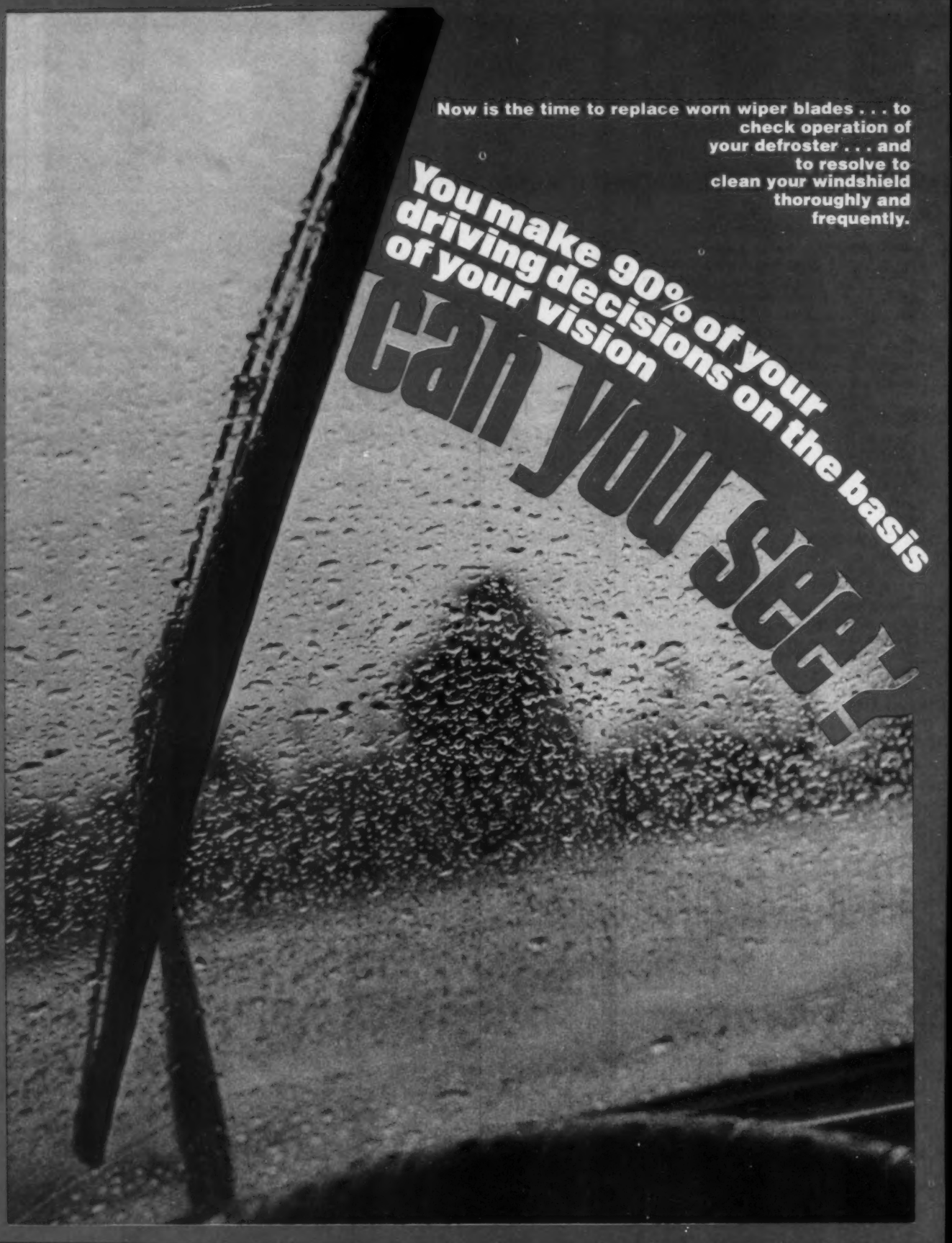
Keep up the good work.

From a fan and beginning mechanic.

Ms. J. Long
2520 N. Lincoln #21
Chicago, IL 60614

We're glad to hear that women are also doing their own mechanics. It only takes a little study and practice. There are only two Volumes of "The Backyard Mechanic" available.

☆U.S. GOVERNMENT PRINTING OFFICE: 1978—683-012/2


Now is the time to replace worn wiper blades . . . to check operation of your defroster . . . and to resolve to clean your windshield thoroughly and frequently.
You make 90% of your driving decisions on the basis of your vision
can you see?